Transfers, money and the balance of payments

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Abstract

The literature on international transfers largely ignores the fact that transfers are often given in the form of money. We analyze both the welfare consequences of financial transfers for the donor and the recipient, and their impact on the current account. Under normal circumstances transfer paradoxes do not occur, the donor's current account deteriorates and the recipient's current account improves.

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1 Introduction

Various aspects of the theory of international transfers have been studied throughout history; from the bullion controversy in the Napoleonic wars to the debate between Keynes and Ohlin after World War I, and from war reparations to development assistance.. Over time, the emphasis has shifted from balance-of-payments and terms-of-trade consequences to a welfare analysis for donor and recipient, see e.g. Samuelson (1947, p. 29), Gale (1974), Chichilnisky (1980), Bhagwati, Brecher and Hatta (1983) and Kemp and Kojima (1985). The common framework of analysis used at present is based on duality theory to study distortions, public goods, many countries, tied aid, etc., see in particular Dixit (1983) and Kemp (1995).

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The modern literature of international transfers assumes that transfers are given by means of commodities or factors of production. Monetary aspects are not investigated. This omission in the literature is remarkable in view of the frequent use of financial transfers in order to relieve foreign exchange shortages in developing countries. In fact, the aim of the International Monetary Fund is to give financial assistance combined with policy advice to restore sustainable economic development and overcome balance-of-payments crises.

We analyze the consequences of financial transfers in a simple, two-country, monetary economy, clarifying not only both aspects traditionally investigated in the literature (welfare effects and the balance-of-payments), but also the link between them.

2 Financial transfers and the balance-of-payments

Our model builds on Dixit and Norman (1980, chapter 7), by investigating the balance-of-payments in the context of Hicksian temporary equilibria. Agents have access to markets for spot commodities today and a financial asset called money. The financial asset is held for buying commodities on the spot market tomorrow, and thus the demand for money is influenced by expectations about future commodity prices. These expectations may be inconsistent across consumers and may turn out to be wrong as the future unravels. If there is perfect foresight, a sequence of Hicksian temporary equilibria coincides with the equilibrium which would obtain with perfect forward markets.

We introduce money holdings in a two-period model. Residents in a country acquire claims on each other, but only in their own country's money. The authorities supply this money in exchange for foreign money. There is an inflow of money supply at a rate equal to a country's trade surplus, which leads to an adjustment process like Hume's specie-flow mechanism. There is a spot commodity with price p^J, relative to money as the numéraire, in country J. There is no storage or money-holding by producers, so they have the usual revenue function $R^J(p^J)$ with supply $R^J_p(p^J)$ of the spot commodity, where a subindex denotes a derivative. Consumers demand spot commodities and money, labelled 0, which is held for buying commodities in the future. We assume that the expected future price ${}_ep^J$ reflects current spot prices in a linearly homogeneous way to avoid money illusion, see equation (4) where ψ^J is homogeneous of degree one. Thus the expenditure function is $E^J({}_ep^J, p^J, u^J)$, with E^J_p the demand for spot commodities and $E^J_0 \equiv E^J_{{}_ep^J}$ the demand for real cash balances. If we let l^J denote the initial money

holdings and T^J the value of the transfer, both denominated in country J's currency, then this gives budget constraints (1) and (2) for donor and recipient, respectively. The market clearing condition for spot commodities is given in (3). Finally, to link the money supplies in the two countries we introduce the fixed exchange rate ϵ in equation (5). An increase in ϵ is a devaluation of the recipient's currency. Equations (1)-(5) can then be thought of as describing a short-run equilibrium with a fixed exchange rate.

$$E^A({}_e p^A, p^A, u^A) = R^A(p^A) + (l^A - T^A) \tag{1}$$

$$E^B({}_e p^B, p^B, u^B) = R^B(p^B) + (l^B + T^B) \tag{2}$$

$$m^A({}_e p^A, p^A, u^A) + m^B({}_e p^B, p^B, u^B) = 0 \tag{3}$$

$${}_e p^J = \psi^J(p^J) \quad for\ J = A, B \tag{4}$$

$$p^B = \epsilon p^A \tag{5}$$

Multiplying (first) the donor's budget constraint, equation (1), by the exchange rate ϵ, using (second) linear homogeneity of the expenditure and revenue functions in prices and (third) linear homogeneity of ψ^A and (fourth) $\epsilon p^A = p^B$ and $\epsilon T^A = T^B$ gives:

$$\epsilon E^A(\psi^A\left(p^A\right), p^A, u^A) = \epsilon R^A(p^A) + \epsilon(l^A - T^A)$$

$$E^A(\epsilon\psi^A\left(p^A\right), \epsilon p^A, u^A) = R^A(\epsilon p^A) + (\epsilon l^A - \epsilon T^A)$$

$$E^A(\psi^A\left(\epsilon p^A\right), \epsilon p^A, u^A) = R^A(\epsilon p^A) + (\epsilon l^A - \epsilon T^A)$$

$$E^A(\psi^A\left(p^B\right), p^B, u^A) = R^A(p^B) + (\epsilon l^A - T^B)$$

If we now, for convenience, define $p \equiv p^B$ and $T \equiv T^B$ we can simplify (1)-(5) to

$$E^A\left(\psi^A(p), p, u^A\right) = R^A(p) + (\epsilon l^A - T) \tag{6}$$

$$E^B\left(\psi^B(p), p, u^B\right) = R^B(p) + (l^B + T) \tag{7}$$

$$m^A\left(\psi^A\left(p\right),p,u^A\right)+m^B\left(\psi^B\left(p\right),p,u^B\right)=0 \tag{8}$$

Let $\bar{l}$ denote the world supply of money at the beginning of the period, that is $\bar{l}\equiv\epsilon l^A+l^B$ and normalize such that $E_u^J=1$, for $J=A,B$. Then differentiating (6)-(8) gives equation (9).[1] Solving (9) gives (10)-(13), where the inequality in (10) represents stability.

$$\begin{bmatrix} \frac{\epsilon l^A-T}{p} & 1 & 0 \\ \frac{l^B+T}{p} & 0 & 1 \\ 0 & m_u^A & m_u^B \end{bmatrix}\begin{bmatrix} dp \\ du^A \\ du^B \end{bmatrix}=\begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}dT \tag{9}$$

$$\det=-\left[(\epsilon l^A-T)m_u^A+\left(l^B+T\right)m_u^B\right]\frac{1}{p}\equiv\frac{-1}{\Delta}<0 \tag{10}$$

$$\frac{dp}{dT}=\left(m_u^B-m_u^A\right)\Delta>0 \qquad iff \quad m_u^B>m_u^A \tag{11}$$

$$\frac{du^A}{dT}=-\frac{\bar{l}}{p}m_u^B\Delta \tag{12}$$

$$\frac{du^B}{dT}=\frac{\bar{l}}{p}m_u^A\Delta \tag{13}$$

Equation (11) translates the familiar conclusion from the literature on the terms-of-trade effect of a transfer to this framework: the price of spot commodities increases if, and only if, the recipient's marginal propensity to consume spot commodities exceeds the donor's marginal propensity to consume spot commodities. Moreover, from equations (12) and (13) it follows that the donor's welfare falls, respectively the recipient's welfare increases, if, and only if, the recipient's, respectively the donor's marginal propensity to consume spot commodities is positive. Not surprisingly, the size of the welfare change is related to the real value of the world money stock.

Proposition 1 *A financial transfer in a stable Hicksian temporary equilibrium increases the price level of spot commodities if, and only if, the recipient's marginal propensity to consume spot commodities is larger than the donor's. This does not give rise to transfer paradoxes if the demand for spot commodities is normal for both countries.*

[1] Differentiating equation (7) with respect to p, for example, gives $E_0^B\psi_p^B+E_p^B-R_p^B$. Using $p\psi_p^BE_0^B+pE_p^B=E$ and $pR_p^B=R$ (from homogeneity of E^B and R^B) and (7) gives $E_0^B\psi_p^B+E_p^B-R_p^B=\frac{l^B+T}{p}$.

What is the influence of a transfer on the trade balance in this model, or more appropriately on the current account? Country J's trade surplus, TB^J say, is the value of the net excess supply of commodities, or $TB^J = p^J(R_p^J - E_p^J)$. Using linear homogeneity of the revenue and expenditure functions, that is $R_p^J\, p^J = R^J$ and $E_{0\ e}^J p^J + E_p^J\, p^J = E^J$, equation (4), the relation between current expenditure and current revenue in equations (1) and (2) and the fact that the transfer is given from country A to country B gives country J's spot current account, CA^J say, in equation (14).[2]

$$CA^J = E_o^J({}_e p^J, p^J, u^J)\psi^J(p^J) - l^A \tag{14}$$

Thus, a country will have a spot current account surplus if its demand for nominal cash holdings exceeds its current nominal cash holdings. Since ψ^J is homogeneous of degree one, E_o^J is homogeneous of degree zero in prices and the sum of the marginal propensities to consume is equal to one, that is $E_{ou}^J \psi^J = 1 - p^J m_u^J$, it follows from (14) that:

$$\frac{dCA^J}{dT^J} = \left(1 - p^J m_u^J\right) \frac{du^J}{dT^J} \tag{15}$$

Equation (15) reveals the simple link between changes in the balance-of-payments and changes in welfare. Thus, if the demand for spot commodities is normal and we do not have any transfer paradoxes, see Proposition 1, then the donor's spot current account deteriorates and the recipient's spot current account improves. Intuitively, if the demand for spot and future commodities are both normal for the donor, then the donor wishes to spread out the consequences of its transfer over the two periods involved. Similar reasoning holds, necessary changes being made, for the recipient of the transfer.

Proposition 2 *A financial transfer in a stable Hicksian temporary equilibrium leads to a deterioration of the donor's current account and an improvement in the recipient's current account if the demand for spot commodities is normal for both countries.*

3 Conclusion

We arrive at two intuitively appealing conclusions in this simple two-period, two-country monetary framework. If agents hold money to purchase future consumption goods and the demand for spot commodities is normal in both countries, we show that:

[2] That is $CA^A = TB^A - T^A$ and $CA^B = TB^B + T^B$.

(i) the donor loses and the recipient gains from the transfer, that is transfer paradoxes do not arise, and

(ii) the donor's current account deteriorates and the recipient's current account improves as a result of the transfer. This is in accordance with the generally held believe that a transfer deteriorates the donor's cu-rrent account and is a simple rationale for financial assistance in case of balance-of-payments crises.

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